and its output can be directly manipulated and observed, e.g., at the switchboard, motor controller, propulsion engine, or other equipment.

Manual control means operation by direct or power-assisted operator intervention.

Monitor means the use of direct observation, instrumentation, alarms, or a combination of these to determine equipment operation.

Remote control means non-local automatic or manual control.

Safety trip control system means a manually or automatically operated system that rapidly shuts down another system or subsystem.

System means a grouping or arrangement of elements that interact to perform a specific function and typically includes the following, as applicable:

A fuel or power source.

Power conversion elements.

Control elements.

Power transmission elements.

Instrumentation.

Safety control elements.

Conditioning elements.

Vital system or equipment is essential to the safety of the vessel, its passengers and crew. This typically includes, but is not limited to, the following:

Fire detection, alarm, and extinguishing systems.

Flooding safety systems.

Ship service and emergency electrical generators, switchgear, and motor control circuits serving vital electrical loads.

The emergency equipment and systems listed in §112.15 of this chapter.

Propulsion systems, including those provided to meet §58.01–35.

Steering systems.

Subpart 62.15—Equivalents

§62.15–1 Conditions under which equivalents may be used.

(a) The Coast Guard accepts a substitute or alternate for the requirements of this part if it provides an equivalent level of safety and reliability. Demonstration of functional equivalence must include comparison of a qualitative failure analysis based on the requirements of this part with a comparable analysis of the proposed substitute or alternate.

Subpart 62.20—Plan Submittal

§62.20–1 Plans for approval.

(a) The following plans must be submitted to the Coast Guard for approval in accordance with §50.20–5 and §50.20–10 of this chapter:

(1) A general arrangement plan of control and monitoring equipment, control locations, and the systems served.

(2) Control and monitoring console, panel, and enclosure layouts.

(3) Schematic or logic diagrams including functional relationships, a written description of operation, and sequences of events for all modes of operation.

(4) A description of control or monitoring system connections to non-vital systems.

(5) A description of programable features.

(6) A description of built-in test features and diagnostics.

(7) Design Verification and Periodic Safety test procedures described in subpart 61.40 of this chapter.

(8) Control system normal and emergency operating instructions.

§62.20–3 Plans for information.

(a) One copy of the following plans must be submitted to the Officer in Charge, Marine Inspection, for use in the evaluation of automated systems provided to replace specific personnel or to reduce overall crew requirements:

(1) Proposed manning, crew organization and utilization, including routine maintenance, all operational evolutions, and emergencies.

(2) A planned maintenance program for all vital systems.

(b) One copy of a qualitative failure analysis must be submitted in accordance with §50.20–5 of this chapter for the following:

(1) Propulsion controls.

(2) Microprocessor-based system hardware.

(3) Safety controls.

(4) Automated electric power management.